

SUPPORT FOR THE AMENDMENTS

The present amendment amends claims 1-6, and adds new claims 11-20.

Support for the claim amendments is found in the specification and claims as originally filed.

Support for newly added claims 11-12 is found at specification page 4, lines 7-14.

Support for newly added claims 13-15 is found at specification page 4, lines 15-19.

Support for newly added claims 16-18 is found at specification page 4, lines 33-36.

Support for newly added claims 19-20 is found at specification page 3, lines 30-31, and page 7, lines 16-34.

It is believed that these amendments have not resulted in the introduction of new matter.

REMARKS

Claims 1-7 and 9-20 are currently pending in the present application. Claims 1-6 have been amended, and new claims 11-20 have been added, by the present amendment.

Applicants wish to extend their appreciation to Examiner Walters and Supervisory Examiner Barr for the helpful and courteous discussion held on January 5, 2009, with their undersigned Representative. During the meeting, the prior art rejection was discussed, along with potential amendments and/or arguments for overcoming the rejection. The content of this discussion is believed to be reflected in the remarks set forth herein.

The rejection of claims 1-7, 9 and 10 under 35 U.S.C. § 103(a) as being obvious over Yutaka (JP 60-109894) in view of Dyllick-Brenzinger (U.S. 6,132,558) is respectfully traversed in part, and obviated by amendment in part, with respect to claims 1-7 and 9-20, which incorporates the transitional phrase “consisting essentially of” into claim 1.

Amended claim 1 recites a process for improving the printability of paper and paper products by *enhancing the water resistance of ink-jet printed images*, wherein the process comprises treating the paper or the paper products with an aqueous solution comprising a cationic polymer, wherein the cationic polymer comprises *positive charge providing units consisting essentially of vinylamine units*, has a charge density of at least 3 meq/g and is used as the *sole treatment composition* in the aqueous solution, wherein the composition is applied in an amount of from 0.05 g/m² to 5 g/m² to the surface of the paper or the surface of the paper product.

Unlike the claimed invention, Yutaka describes a method for imparting water resistance and light resistance to an ink-jet recorded image comprising applying to a surface of an ink-jet recording paper an aqueous solution comprising: 95-50 wt. % of a dimethyl diallyl ammonium chloride polymer having *allylammonium units to impart water resistance* to the ink-jet recorded image; and 5-50 wt. % of an ethyleneimine polymer having *vinyllamine units to impart light resistance* to the ink-jet recorded image (See e.g., page 3, lines 12-23). Therefore, contrary to the

present invention, which involves enhancing the water resistance of ink-jet printed images to thereby improve the printability of paper and paper products by treating the same with an aqueous solution comprising a cationic polymer comprising positive charge providing units consisting essentially of vinylamine units and having a charge density of at least 3 meq/g as the sole treatment composition, Yutaka describes treating the paper with a mixture of cationic polymers comprising allylammonium units and vinylamine units as positive charge providing units to impart water resistance and light resistance, respectively.

Unlike the claimed invention, Dyllick-Brenzinger describes a method for *increasing the draining rate of raw material pulps* in a process for producing paper and cardboard comprising adding to the raw material pulps cationic polymers (e.g., polyethyleneimine) having vinylamine units and a charge density of 4-18 meq/g (See e.g., abstract, column 1, lines 61-67, column 2, lines 1-12, column 5, lines 30-32, and column 6, lines 12-21). Dyllick-Brenzinger is completely silent as to ink-jet printed images and methods of enhancing the water resistance thereof.

Applicants respectfully submit that contrary to page 5, lines 7-10 of the Official Action, a skilled artisan would not have been motivated to combine Yutaka with the *clearly unrelated reference of Dyllick-Brenzinger*, since Yutaka is directed to a method for imparting water resistance and light resistance to an ink-jet recorded image, whereas Dyllick-Brenzinger is directed to a method for increasing the draining rate of raw material pulps in a process for producing paper and cardboard.

Applicants further submit that even if sufficient motivation and guidance is considered to exist for a skilled artisan to combine Yutaka with the clearly unrelated reference of Dyllick-Brenzinger, a skilled artisan would *not* have had a *reasonable expectation of success* for improving the printability of paper and paper products by enhancing the water resistance of ink-jet printed images by treating the same with an aqueous solution comprising a cationic polymer comprising positive charge providing units consisting essentially of vinylamine units and having a charge

density of at least 3 meq/g as the sole treatment composition, since Yutaka teaches away from doing so by disclosing that polyethyleneimine *alone* imparts *insufficient* water resistance to the ink-jet recorded image (See e.g., page 4, lines 11-13).

Therefore, Yutaka and Dyllick-Brenzinger, when considered alone or in combination, fail to provide sufficient motivation and guidance to a skilled artisan to improve the printability of paper and paper products by enhancing the water resistance of ink-jet printed images, wherein the process comprises treating the same with an aqueous solution comprising a cationic polymer comprising positive charge providing units consisting essentially of vinylamine units and having a charge density of at least 3 meq/g as the sole treatment composition, as presently claimed.

Even if sufficient motivation and guidance is considered to have been provided by Yutaka and/or Dyllick-Brenzinger, to arrive at the claimed process, which is clearly not the case, such a case of obviousness is rebutted by a showing of superior properties and secondary considerations.

As discussed in the present specification, conventional paper (e.g., ink-jet paper) suffers from running of the inks into unprinted regions of the paper (a.k.a., wicking) and into one another (a.k.a., bleeding) upon exposure to moisture or liquid (See e.g., page 1, lines 34-41, page 2, lines 1-9, and page 6, lines 11-17). Accordingly, there has been a long-felt need to improve the printability of paper and paper products by enhancing the water resistance of the ink-jet printed images, whereby the ink-jet printed images do not exhibit wicking and bleeding upon exposure to moisture or liquid. Based on the limited disclosures of Yutaka and Dyllick-Brenzinger, and the conventional papers described therein, other skilled artisans have failed to discover a solution to this long-felt need.

As discussed in the present specification and shown by the comparative experimental data presented in Table 1 therein, Applicants have discovered that superior properties with respect to improved printability of paper and paper products and suppressed wicking and bleeding due to enhanced water resistance of the ink-jet printed images are unexpectedly exhibited by treating the

surface of the paper and paper products with aqueous solutions comprising a cationic polymer comprising *positive charge providing units consisting essentially of vinylamine units* and having a charge density of at least 3 meq/g as the *sole treatment composition* in accordance with the present invention (Examples V-IX), as compared to the inferior properties exhibited by the conventional treatment compositions, which contain the dimethyldiallylammonium chloride cationic polymer having allylammonium units of Yutaka (Comparative Example I) or a cationic polymer having a charge density of only 1.5 meq/g (Comparative Example IV) (See e.g., page 3, lines 1-3, page 6, lines 19-40, page 6, lines 11-34, and page 9, Table 1).

This evidence clearly demonstrates that superior properties with respect to improved printability of paper and paper products and suppressed wicking and bleeding due to enhanced water resistance of the ink-jet printed images are remarkably exhibited by treating the surface of the paper and paper products with an aqueous solution comprising a cationic polymer comprising positive charge providing units consisting essentially of vinylamine units and having a charge density of at least 3 meq/g as the sole treatment composition in accordance with the present invention.

Withdrawal of this ground of rejection is respectfully requested.

In conclusion, Applicants submit that the present application is now in condition for allowance and notification to this effect is earnestly solicited.

Respectfully submitted,

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